

78-79

CIRCULAR AND CATALOGUE

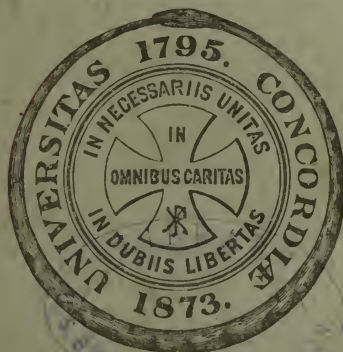
OF

268

UNION COLLEGE.

EIGHTY-FOURTH YEAR.

1878-79



ALBANY:
J. MUNSELL, 82 STATE ST.
March, 1879.

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CIRCULAR AND CATALOGUE

OF

UNION COLLEGE

1879.



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1878/79

UNION UNIVERSITY.

UNION COLLEGE was incorporated by the Regents of the University of the State of New York on the 25th day of February, 1795. It was the second college incorporated in the state and the first north of the city of New York and west of the Hudson river. It received its name from the circumstance that several religious denominations coöperated in its organization, and was the first college in the United States not strictly denominational. It has continued from its foundation to be the representative institution of Christian unity.

Union College acquired by its charter full University powers; but the creation of post-graduate institutions at Schenectady had not been found practicable. Schools of Law and Medicine and also an Astronomical Observatory had long existed at Albany, the distance between which city and Schenectady, estimated in time, is less than that which in many cases separates the professional schools from the other departments of a university. The arrangement naturally suggested by these circumstances was that the Professional Schools and the Observatory at Albany should be united with Union College under the Charter and Board of Trustees of the latter. This union of the several institutions was consummated by the incorporation of Union University, A.D. 1873.

65270

TRUSTEES OF UNION COLLEGE.

Incorporated, A. D. 1795.

Ex Officio. { His Excellency LUCIUS ROBINSON, *Governor.*
 Hon. WILLIAM DORSHEIMER, *Lieut. Governor.*
 Hon. ALLEN C. BEACH, *Secretary of State.*
 Hon. FREDERICK P. QLCOTT, *Comptroller.*
 Hon. JAMES MACKIN, *Treasurer.*
 Hon AUGUSTUS SCHOONMAKER, Jr., *Attorney General.*

Also Governors of Union University. { Hon. WILLIAM W. CAMPBELL, LL.D.
 Rev. EBENEZER HALLEY, D.D.
 Rev. J. TRUMBULL BACKUS, D.D., LL.D.
 Hon. CLARKSON N. POTTER, LL.D.
 Hon. PLATT POTTER, LL.D.
 Hon. CHARLES C. NOTT.
 WILLIAM TRACY, LL.D.
 JOSEPH W. FULLER, ESQ.
 ELIPHALET NOTT POTTER, D.D., LL.D.
 Hon. THOMAS W. OLCOTT.
 Gen. FREDERIC TOWNSEND.
 SILAS B. BROWNELL, ESQ.
 Rev. WILLIAM IRVIN, D.D.
 Hon JUDSON S. LANDON.
 Hon. EDWARD W. PAIGE.

THOMAS ALLEN, LL.D.,	Term of office expires June, 1879
Rev. JAMES RANKINE, D.D.,	" " " 1880
ROBERT H. McCLELLAN, ESQ.,	" " " 1881
AMASA J. PARKER, Jr., ESQ.,	" " " 1882

JONATHAN PEARSON, *Treasurer.*

EDGAR M. JENKINS, *Assistant Treasurer and Secretary.*

VISITORS OF THE NOTT TRUST FUND.

URANIA E. NOTT.	REV. WILLIAM PAYNE, D.D.
HON. W. W. CAMPBELL, LL.D.	REV. WILLIAM E. GRIFFES.
REV. TIMOTHY G. DARLING.	

CURATORS OF THE LIBRARY AND OF BUILDINGS AND PARKS.

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J. TRUMBULL BACKUS, D.D.,	JOHN CROSEY BROWN, Esq.
LL.D.	GEO. HUNTER BROWN, Esq.
HOWARD POTTER, Esq.	HON. FRED. W. SEWARD, LL.D.
JOHN HOBART WARREN, Esq.	HON. SAMUEL BLATCHFORD,
SAMUEL T. BENEDICT, Esq.	LL.D.
WM. H. H. MOORE, Esq.	HENRY C. POTTER, D.D., LL.D.
ROBERT LENOX	KENNEDY, Esq.

CHANCELLORS OF UNION UNIVERSITY.

HON. WM. PORCHER MILES, LL.D., 1878.
HON. GEORGE WM. CURTIS, LL.D., 1877.
RT. HON. WM. E. GLADSTONE, D.C.L., elect, 1876.
RT. REV. HORATIO POTTER, D.D., LL.D., D.C.L., 1875.
HON. JOHN A. DIX, LL.D., 1874.
HON. HORATIO SEYMOUR, LL.D., 1873.
ELIPHALET N. POTTER, D.D., LL.D., permanent.

GOVERNORS OF UNION UNIVERSITY.

HON. THOS. W. OLCOTT,	ROBERT H. PRUYN, LL.D.,
THOMAS HUN, LL.D.,	ISAAC EDWARDS, LL.D.,
HON. AMASA J. PARKER, LL.D.,	HENRY H. MARTIN, Esq.,

THE PERMANENT TRUSTEES OF UNION COLLEGE.

UNION COLLEGE CALENDAR,

1879.

JAN. 6, Winter Term begins.
MAR. 28, " " ends.
" 31, Spring Term begins.
JUNE 25, " " ends.
" 22, Sunday, Baccalaureate Sermon.
" 24, Tuesday, Prize Speaking.
" 24, Trustees, Phi Beta Kappa and Alumni
day.
" 25, Commencement.
" 26, 27, Examinations for Admission.
SEP. 17, Fall Term begins.
DEC 19, " " ends.

UNION COLLEGE.

FACULTY.

ELIPHALET NOTT POTTER, D.D., LL.D.,
*President and Professor of Moral Philosophy, Christian Evidences and
the Constitution.*

JOHN FOSTER, LL.D.,
Nott Professor (No. 8) of Natural Philosophy.

JONATHAN PEARSON, A.M.,
Professor of Agriculture and Botany.

HENRY WHITEHORNE, A.M.,
Nott Professor (No. 1) of Greek Language and Literature.

WILLIAM WELLS, LL.D.,
Professor of Modern Languages and Literature.

MAURICE PERKINS, A.M., M.D.,
*Nott Professor (No. 3) of Analytical Chemistry and Curator of the Mu-
seum.*

REV. GEORGE ALEXANDER, A.M.,
Professor of Logic and Rhetoric.

CADY STALEY, A.M., C.E.,
Professor of Civil Engineering.

HARRISON E. WEBSTER, A.M.,
Professor of Natural History.

REV. ROBERT T. S. LOWELL, D.D.,
Professor of the Latin Language and Literature.

REV. TIMOTHY GRENVILLE DARLING, A.M.,
Acting Professor of Mental Philosophy and Hebrew.

ISAIAH B. PRICE, C.E.,
Professor of Mathematics and Adjunct Professor of Physics

HENRY COPPEE, LL.D.,
Professor of History, English Literature and Philology.

REV. EDWARD A. WASHBURN, D.D.,
Lectures on Old English and on Art.

PROF. WENDELL LAMOROUX, A.M.,
English Essays and Oratory; and Assistant Librarian.

WILLIAM A. POTTER, A.M.,
Professor of Architecture.

CHARLES J. COLCOCK, C.E.,
Tutor in Mathematics.

JOSEPH R. DAVIS, A.B.,
Tutor in Latin and Greek.

NEWTON A. WELLS, B.P.,
Instructor in Drawing.

LIEUT. CLERMONT L. BEST, JR., U.S.A.,
Professor of Military Science.

CHARLES W. VANDERVEER,
Instructor in Physical Culture.

SAMUEL B. HOWE, A.M.,
Adjunct Nott Professor (No. 4), Principal of Union School and Superintendent of the Schools of Schenectady.

HON. WM. PORCHER MILES, LL.D.,
Honorary Chancellor, 1878.

JONATHAN PEARSON, A.M.,
Treasurer and Librarian.

EDGAR M. JENKINS, Esq.,
Assistant Treasurer and Registrar.

INFORMATION.

COURSES OF STUDY.

1. Classical Course.

This is the usual baccalaureate course of American Colleges. Students may pursue additional studies in any of the other courses.

2. Scientific Course.

In this course the modern languages are substituted for the ancient, and the amount of mathematical and English studies is increased.

3. School of Civil Engineering.

In this department such instruction in the theory and practice of Civil Engineering is given as will qualify the student for immediate usefulness in the field and office in a subordinate capacity, and at the same time prepare him to fill satisfactorily the higher positions in the profession, after a moderate amount of experience in the routine of practice. Candidates for a diploma are required to sustain an examination on the leading points of all the studies of the course. Those who pass it satisfactorily receive a diploma conferring the degree of Civil Engineer (C.E.). The student in this department enjoys advantages nowhere surpassed in its collections of models, instruments and books, the accumulation of many years by the late Professor Gillespie, and also in unusual facilities for acquiring practical knowledge of instrumental field-work. To young men of good capacity and high character, in need of pecu-

niary assistance, special aid will be given in this as in all other courses of the College.

4. Eclectic Course.

This course, consisting of studies selected at pleasure from the preceding courses, may be taken by any one who upon examination is found qualified to pursue it. On its completion a Certificate of Attainment will be given.

5. Chemical Department.

The course in this department includes instruction in Theoretical and Experimental Chemistry and Systematic Qualitative and Quantitative Analysis in all their branches; and in the applications of the science to the arts and manufactures. It is especially adapted to students of Agriculture, Medical Students, Pharmacutists, Manufacturing Chemists, Mineralogists, Metallurgists, etc.

6. Department of Natural History.

The regular course in this department includes instruction in Physiology Zoölogy and Geology. Students desiring to pursue these studies farther than is practicable in the regular course will be furnished with the necessary materials and allowed to work under the instruction of the Professors without additional expense.

7. Department of Agriculture.

Instruction is given in Agriculture, Botany, etc., without extra charge. Union College possesses an extensive garden and a College farm.

8. Astronomical Observatory.

Astronomical and Meteorological Observations are regularly made at the Dudley Observatory. A large quantity of rare and costly apparatus has lately been procured, to-

gether with the funds necessary for the erection of separate buildings. Instruction is given to special students.

9. The Gymnasium,

lately erected, and the Department of Physical Training and Military Instruction are under the charge of an officer of the Army and of an Instructor in Gymnastics.

ADMISSION.

Candidates for admission must present testimonials of good moral character and must be at least sixteen years of age. If not previously vaccinated, they will be required to become so before joining the college.

Examinations for admission take place in presence of three College officers.

The stated times for such examinations are the two days (Thursday and Friday) following Commencement Day; and the last two days (Monday and Tuesday) of each vacation. The full dates will be found in the Calendar. By conforming to these appointments, applicants will greatly promote their own convenience and interest as well as those of the examiners.

Candidates for the Freshman class in the Classical course will be examined in English Grammar; Arithmetic (Davies' University, or an equivalent); Algebra (to equations of the second degree); Plane Geometry, five books; Allen & Greenough's Latin Grammar, including Prosody; Caesar's Gallic War, four books; Virgil's *Aeneid*, six books; Cicero, six Orations including Milo; Sallust's *Catiline*, or *Jugurtha*; Leighton's Latin Composition (Prose); Goodwin's Greek Grammar and Leighton's or Jones's Greek Composition; Xenophon's *Anabasis*, three books; Homer's *Iliad*,

one book ; and Ancient Geography. The attention of instructors is particularly directed to the necessity of a full and accurate knowledge of the Greek and Latin Grammars. Deficiency in this knowledge will preclude admission.¹

Those intending to pursue the Classical course should enter at the beginning of the Freshman year, fully prepared. Deficiencies must be made up before the student can acquire full standing in College, and this effort consumes time and strength that are needed for his regular studies.

Candidates for the Freshman class in the Scientific course will be examined in English Grammar, Modern Geography, Arithmetic, Algebra to equations of the second degree, and Plane Geometry (five books).

Candidates for any other class will also be examined in all the studies previously pursued by that class, as shown in the course as given below.

Students from other colleges, in addition to passing a satisfactory examination, will be required to present a letter of honorable dismissal.

It is very important that candidates should be thoroughly prepared, especially in grammatical and elementary knowledge. If in their preparation they have more time than is required for this purpose, it is desirable for obvious reasons that they should not anticipate the college studies but should apply themselves to other subjects or authors.

If a candidate upon examination shows ability to proceed with the studies of the class for which he offers himself, he will be received on probation and will enjoy all the privileges of the class.

¹ The diversity in elementary books is one of the great difficulties a college has to meet. To avoid this, all instructors who intend to send pupils to Union College are requested to use the elementary books mentioned here.

When his scholarship and conduct shall warrant it, he will be admitted to full standing.

DEPARTMENTS OF INSTRUCTION.

1. The Greek Language and Literature.

The course of instruction in this department extends through the Freshman and the Sophomore year and the first and second term of the Junior. The object kept constantly in view throughout the course is not merely to teach so many works of an unknown tongue but to instruct and educate the pupil by a system of mental training grounded upon the works of the most noble poets, dramatists, historians and philosophers of the ancient world. To this end the pupil is taught not only to translate into accurate and idiomatic English, to analyze with great care the grammatical construction and to compare it with that of his own tongue, but especially to obtain a thorough knowledge and critical appreciation of the authors selected for his use.

Although there must be a general uniformity in the order in which different authors are read, yet no particular works are assigned to the several terms. The proficiency of each class determines the character of the book to be read.

During the Senior year, lectures will be delivered on Greek Philosophy, Greek Poetry and Greek Literature in general.

2. The Latin Language and Literature.

The course of teaching in this Department during the Freshman and the Sophomore year and the first and second

term of the Junior year, takes in so much of the better Latin classics (in prose and poetry) and so much practice of Latin writing as the time will allow to be well done. It is aimed to acquaint growing minds with the highest and strongest thought and with the most beautiful and finished expression of Roman men of genius and education ; and to familiarize the student with the structure and capabilities of a language which if in some respects inferior is also in some respects superior to our own. The study is illustrated by the history and topography directly involved and by the religion, polity, science and warfare of nations as well as by the character and achievements of individuals. Light is thrown upon the Roman Language and Literature from our own, while in turn our own authors and their works are illustrated by those of Rome. The course is graduated for the several years and, although nearly uniform in amount, is varied by equivalent selections with different classes.

During the Senior year, lectures will be delivered on Latin Literature and Philosophy.

3. Modern Languages.

The Modern Languages supply the linguistic training of the Scientific course and are regular daily studies during the Freshman, Sophomore and Junior year; one hour a day being given to each class, and the studies alternating according to the schedule.

Instruction is imparted by exercises in translation (written and oral), conversational practice and familiar lectures on the standard authors read.

The French Language is a regular study through six terms, beginning with the first term Freshman. The text

book mainly used is Pujol's Complete French Course. At a later period classical and contemporary French Literature are read.

The study of the German Language commences with the first term Sophomore. The text-books are Comfort's Grammar, Whitney's Reader and the Poets Schiller and Goethe.

The Italian and Spanish languages are voluntary studies, and classes are formed only when the demand is sufficient to justify them.

In addition to the above text-books, are recommended : Spiers and Surenné's French Pronouncing Dictionary, Adler's German and English Dictionary.

The recitations in the Modern Languages are so arranged, when possible, that they may be also taken by regular Classical students.

4. Art Instruction and General Culture.

This department, sustained by the generous benefactress who endowed the John David Wolfe Memorial Scholarships Foundation, aims, in connection with the regular College courses, to furnish to the student such instruction and practice in Belles Lettres and Art as will contribute to his general culture; and to furnish to the Art student the principles, methods and practice of his specialty.

Lectures and other instruction are given in Belles Lettres and Art, on Social and Practical life, Self-Culture and other similar subjects. English Essays are required through the whole course, and Oratorical Exercises from the first term Sophomore. The student is informed regarding the mental tendencies evinced in his essays and is advised as to the reading and kind of self-culture particularly adapted to his

needs. Lectures on Architecture, Painting, Sculpture and Music are given. Practice in Free-hand drawing (with yearly prizes for proficiency and for comparative improvement) is open to all students without charge ; as are also all other advantages of this department.

5. Mathematics.

The Mathematical studies are arranged as follows :

FRESHMAN YEAR.

- First Term...* Algebra, to "Series."
Second Term. Algebra completed.
Third Term.. Geometry, books VI to IX. Trigonometry (Jackson).

SOPHOMORE YEAR.

- First Term...* Descriptive and Analytical Geometry.
Second Term.. Conic Sections, Calculus and Desc. Geom.
Third Term.. Calculus.

6. Natural Philosophy and Astronomy.

The instruction in this department begins with the first term of the Junior year. Students in the Academical department, both of the Classical and the Scientific course, and those in the Engineering department, recite in two divisions (one hour being given to each) four days in the week; and the subjects proceed in the following order:

JUNIOR YEAR.

- First Term...* Mechanical "Work." Hydrostatics, Hydrodynamics, Pneumatics — (Jackson).
Second Term.. Heat, the Steam Engine, Electricity, Meteorology — (Foster).
Third Term... Acoustics, Magnetism, Galvanism and Electro-Magnetism — (Foster).

SENIOR YEAR.

- First Term....* Optics; Wave theory of light and of radiant heat.
Second Term.. Astronomy (Gummere).

To secure at once precision and fullness, the instruction is mainly given from recently prepared text-books. Frequent lectures are however delivered either to furnish illustration and proofs of principles by experiment or to amplify particular subjects. Thus, after the completion of Statics and Dynamics, several lectures are devoted to mechanical "work" in order that not only the construction and theory, but modes of determining the *efficiency*, of the various hydraulic and pneumatic machines may be understood. All lectures are required to be written out by the students in full from the notes and submitted for inspection. Numerous problems are also given on all the subjects and are mostly so constructed that the calculated results may be verified by experiments before the class. To test the accuracy of the knowledge gained and to ensure its ready command, several written examinations are required in each term.

In most of the branches included in this department the apparatus is sufficient for very complete experimental illustrations; and through the liberality of friends of the College, important additions of French, English and American instruments have been made within the present year.

7. Chemistry.

In the undergraduate department, Chemistry is taught by daily lectures and recitations during the third Sophomore term and the first Junior term.

There has recently been established a regular daily two-hours course of experimental Chemistry at the Laboratory ;

in connection with which there is an extra charge for the material etc. used.

The Nott Laboratory is open for special students, in all branches of Chemistry ; especially for students of Agriculture or Medicine, Pharmacutists, Manufacturing Chemists, Mineralogists, Metallurgists, students of Medical Jurisprudence etc.

Those who desire to devote but a portion of their time to Chemistry can pursue other studies in the Collegiate course. No previous knowledge of the science is required, though it is highly desirable.

The course will include instruction in Theoretical and Experimental Chemistry and systematic Qualitative and Quantitative Analysis in all their branches and in the applications of the science to the arts and manufactures.

Text Books and Books of Reference.

Cooke's Chemistry.	Knapp's Chemical Technology.
Craft's Qualitative Chemical Analysis.	Dana's Mineralogy.
Fresenius's Analysis.	Gmelin's Hand-Book of Chemistry.
Cooke's Chemical Physics.	Muspratt's Chemistry applied to Arts and Manufactures.
Miller's Chemical Physics.	Lehmann's Physiological Chemistry.
Miller's Elements of Chemistry.	Regnault's Elements de Chimie.
Dalton's Physiology.	
Percy's Metallurgy.	

Fees for full course of special instruction in the Laboratory, \$35 per term ; for half-day course, \$25 per term ; two-hours course, \$10 per term ; a deposit of \$15 for materials and use of apparatus being required in the two former courses, and one of \$10 in the latter ; the amount

not consumed being returned. The expenditure varies from \$2 to \$20 a term.

For fuller information, address Prof. Maurice Perkins, M.D.

8. Natural History.

PHYSIOLOGY is taught in the second Junior term to the whole class by recitations and by lectures on Comparative Anatomy and Physiology. The subjects are illustrated by preparations and dissections.

ZOOLOGY is taught in the Scientific course during the third Junior term by recitations and lectures. The work is illustrated by constant exhibition of specimens and dissections in the class-room.

GEOLOGY is taught during the first term of Senior year by a daily course of recitations and lectures.

MINERALOGY is taught during the third term by a course of practical lessons, illustrated by a complete set of models of crystals and series of six hundred specimens for determination by crystallographic and blowpipe examination.

The facilities for instruction in these departments have been largely increased by the addition to the College Cabinet of the Wheatley Collection of Minerals and Shells, purchased by E. C. Delavan, Esq., for ten thousand dollars, and presented by him to the College.

BOTANY is taught during the Summer term, both from text-book (Gray's) and practically in the field.

9. Logic, Rhetoric and English Literature.

The instruction in Logic and Rhetoric includes the use of text-books, lectures and practical exercises in oratory and the various forms of essay. In the study of English Literature, it is the aim to secure an acquaintance with the historical development of the language and with the course of English thought as expressed at different periods in the works of representative men.

The study of the English language begins with the Freshman year and continues (except one term) through the second term Sophomore. Rhetoric is taught in the first Sophomore term and Logic in the first Junior term.

The text-books and books of reference are as follows :

In Rhetoric :— Hill's Rhetoric.

In English Literature :— Clark's English Language; Marsh's Lectures ; Craik's English Literature ; Taine's English Literature; Hart's Manual of American Literature and Coppee's English Literature. •

10. History and Political Economy.

It is proposed to give the student a knowledge of the facts and philosophy of history, both by lectures and recitations. In the department of Political Economy he is taught the fundamental principles, conflicting theories and practical issues of the subject and thus is prepared for the intelligent prosecution of the study.

11. Mental and Moral Science.

The elements and history of Mental and Moral Science are taught by the use of text-books, with oral explanations and illustrations. The effort is made to give the student an adequate knowledge of the history and present position of mental and moral philosophy, to acquaint him with the nature and value of their problems, to accustom him to their modes of reasoning and thus to prepare him for intelligent investigation.

12. Religious and Biblical Instruction.

The President has the general oversight of this department. During the Senior year, there will be given by him a course of lectures upon the Claims and Evidences of Revealed Religion, upon Natural Theology and Christian Ethics. The religious teaching, while distinctly and earnestly Christian, is not denominational, but as heretofore is consistent with the design and chartered title of the College as the representative Institution of the principles of Christian Unity. Members of the Faculty and others conduct Bible classes and exercise definite Christian influence in relation to the students.

Daily service is held in the College Chapel.

MISCELLANEOUS INFORMATION.

1. **TERMS AND VACATIONS.** There are three Terms of the average length of thirteen weeks. Commencement occurs annually on the fourth Wednesday in June; and the First Term begins twelve weeks after that time. This term is followed by a Vacation of nearly two weeks, embracing the

Christmas holidays, and there is also a brief recess in the Spring. The Second Term consists of twelve weeks. The Third Term ends with Commencement.

2. PAYMENTS AND EXPENSES. The College bills must be paid at the beginning of each term. In case such payment is not made within the first week of the term, the Treasurer is instructed to inform the parent or guardian of the delinquent.

Students, unless from another College, pay for entrance into the Freshman class, \$5 ; into the Sophomore class, \$8 ; into the Junior class, \$9 ; into the Senior class, \$12.

No retrospective expense is incurred by entering an advanced class.

The College bills for tuition and room are \$40 per term ; for the Chemical instruction, as on page 18 ; the expenses of instruction, board, lights, washing, text-books etc. during the three terms of thirty-nine weeks may vary in amount from \$250 to \$350. Furniture can be bought and resold on leaving or be hired of the college servants. The President desires it to be understood that special provision is made in aid of the boarding and other expenses of students of high character and attainments needing assistance. Board costs from \$2.50 to \$5 a week.

3. RESIDENCE AND DISCIPLINE.—Students are expected to reside in the main buildings, under the immediate supervision of the President and Professors. No student can reside elsewhere without special permission.

The discipline of the Institution is moral and parental. Disgraceful punishments are not inflicted ; but no young man who indulges in gaming, intemperance or other vice,

who is absent from his room at night or who habitually neglects his studies can be allowed to remain.

Parents or guardians are requested either to appoint a special guardian for their sons or wards or to deposit all funds intended for their use with the Treasurer or Registrar of the College, who will act as fiscal guardian.

An account of the delinquencies of each student and of his daily attendance, conduct and scholarship, is kept by the Registrar. The result, determining his place on the Merit Roll, is reported at the close of each term or more frequently to his parent or guardian.

Each student is required to return punctually at the beginning of the term and report himself at the Registrar's office ; and until he thus reports himself he is considered as absent and is so marked on his bill. A similar report is required after any temporary absence from sickness or by permission.

Parents are requested to inform the Registrar, by their sons, what church they wish them to attend.

SCHOLARSHIPS.

1. Ordinary Scholarships.

To a large class of students, Union College presents extraordinary advantages in its numerous scholarships. In the scholarships of the first grade, the incumbents, on the condition of good conduct and diligence, receive at the end of each term a credit on the books of the Registrar to the full amount of the term bill.

In the scholarships of the second grade, the incumbents, on the same condition, receive a credit to the amount of half the term bill.

These scholarships are accessible, under certain restrictions, to all who present the requisite certificates of character and sustain the examinations required for admission to the regular classes.

2. *Prize Scholarships.*

Among the several classes of scholarships founded by the late President Nott¹ is a class of Prize Scholarships.

An examination of candidates for these scholarships is held early in the first term of the Freshman Year and also at a later period in the same year, and the appointments are made according to certain rules prescribed by the founder.

The pecuniary emolument of a Prize Scholarship is thirty-five dollars a term, or four hundred and twenty dollars for the whole College course; a provision which enables the incumbent, after paying his College bills, to retain the sum of one hundred and twenty dollars.

The possession of a Prize Scholarship being a special distinction, the incumbent is expected and required to maintain throughout his whole course high standing in all respects.

Among the rules which the incumbent is required to observe is one which forbids the use during the period of incumbency, of intoxicating liquor as a beverage and of tobacco in all its forms.

¹ Few of these are yet actually endowed, but their ultimate endowment is secured by the prospective sale of valuable lands.

MEDALS AND PRIZES.

1. THE BLATCHFORD ORATORICAL MEDALS. Hon. R. M. Blatchford, LL.D., has founded an Oratorical Prize, consisting of two Gold medals, of the value of the interest of \$1,000, to be given to the two members of the graduating class who shall deliver at Commencement the best Orations; "regard being had alike to their elevated and classical character and to their graceful and effective delivery." These medals, of the values of forty and thirty dollars, for the orations first and second in merit, are awarded at the close of the exercises by a committee appointed for the purpose.

2. THE WARNER PRIZE. Hon. H. G. Warner, LL.D., of Rochester, has founded an Annual Prize consisting of Silver Plate of the value of \$50, to be awarded to the "graduate of Union College Classical course who shall reach the highest standing in the performance of collegiate duties and also sustain the best character for moral rectitude and deportment, without regard to religious practice or profession." The prize, awarded by the officers of the College, is presented at Commencement.

3. THE INGHAM PRIZE. Hon. Albert C. Ingham, LL.D., of Meridian, N. Y., for the purpose of promoting a familiarity with the best English classics, has founded an Annual Prize of seventy dollars (in the form of plate or money, as preferred)¹ to be awarded to that member of

¹ Provision has been made for the case in which the incumbent may prefer to receive either the whole or a part of this sum in medals instead of money.

the Senior Class (connected with the College for not less than two years) who shall present the best essay on one of two subjects previously assigned in English Literature or History. This Prize is awarded at Commencement by a committee.

4. GENERAL PRIZES FOR ESSAYS. Prizes are awarded to the two members of the Senior class who present the best Essays on English Literature, on subjects assigned the previous term.

5. UNDERGRADUATE PRIZES FOR SPEAKING. Prizes are awarded to the two Juniors and the two Sophomores who deliver the best Orations on the occasion of Prize Speaking in Commencement week. Six Juniors and four Sophomores are selected for this competition ; regard being given both to composition and delivery.

The Prizes consist of valuable books and are announced at Commencement.

INAUGURAL PRIZE. This Prize, established by the President at his inauguration, is assigned from year to year under such conditions as may be previously announced.

FINAL MERIT ROLL.—The position of a graduating student's name on the Final Merit Roll depends entirely on his standing at the entrance Examination and on his subsequent relative diligence, punctuality, gentlemanlike demeanor and moral conduct.

Degrees are conferred at graduation only upon students of the College who have satisfactorily sustained the examinations for degrees.

NOTE. This edition of the catalogue is printed to meet the numerous unanswered calls which have accumulated. A later edition may contain additional material and modifications.

COURSES OF STUDY.

COURSES OF STUDY.

CLASSICAL COURSE.

FRESHMAN CLASS.

FIRST TERM.

Livy,.....	<i>Lincoln</i>
Xenophon, Homer.	
Algebra, continued to Series.	<i>Bourdon</i>
Greek prose composition.....	<i>Boise</i>
Latin prose composition.....	<i>Allen</i>
English.	

SECOND TERM.

Horace.	<i>Lincoln</i>
Xenophon, Homer, Herodotus.	
Algebra, completed.	<i>Davies</i>
Greek prose composition.....	<i>Boise</i>
Latin prose composition	<i>Allen</i>
English.	

THIRD TERM.

Cicero — De Senectute and De Amicitia	<i>Thatcher</i>
Xenophon, Herodotus, Euripides.	
Geometry — Books VI to IX.....	<i>Legendre</i>
Trigonometry.....	<i>Jackson</i>
English.	
Greek prose composition	<i>Boise</i>
Latin prose composition	<i>Allen</i>

Physical culture two hours a week. English Composition or Essay throughout the year.

SOPHOMORE CLASS.

FIRST TERM.

Tacitus.	
Euripides, Æschylus.	
History of the United States.	
Rhetoric.....	<i>Hill</i>
Analytic Geometry.	

SECOND TERM.

Juvenal, Terence.	
Euripides, Æschylus.	
Conic Sections.....	<i>Jackson</i>
English.	

COURSES OF STUDY.

SCIENTIFIC COURSE.

FRESHMAN CLASS.

FIRST TERM.

Latin or English.
French Grammar.....*Pujol*
Algebra continued to Series*Bourdon*
History.

SECOND TERM.

Latin or English.
French Grammar and Reader*Pujol*
Algebra completed*Bourdon*

THIRD TERM.

French Grammar and Reader*Pujol*
Geometry — Books VI to IX.....*Legendre*
English.
Trigonometry.....*Jackson*
Physical culture two hours a week. English Composition or
Essay throughout the year.

SOPHOMORE CLASS.

FIRST TERM.

French Classic Poetry.
German Grammar.....*Comfort*
Descriptive Geometry.
History of the United States.
Rhetoric.
Analytic Geometry.

SECOND TERM.

Contemporary French Literature.
German Grammar.....*Comfort*
English.
Ancient History.
Calculus.....*Hill*
Descriptive Geometry.

THIRD TERM.

Horace — Satires and Epistles.

Euripides, Sophocles, Plato.

English.

Chemistry.

Botany (voluntary)..... *Gray*

History.

Physical culture two hours a week. English Essay and Oratory throughout the year.

JUNIOR CLASS.

FIRST TERM.

Cicero — Tusculan Disputations.

Sophocles, Æschylus, Thucydides.

Mechanical Work, Hydrostatics, Hydrodynamics,

Pneumatics..... *Jackson*

Logic. *Jevons*

SECOND TERM.

Lucretius or Quintilian.

Plato, Demosthenes.

Heat, Steam Engine, Electricity, Meteorology *Foster*

Physiology..... *Huxley*

THIRD TERM.

Acoustics, Magnetism, Galvanism, Electro-Magnetism..... *Foster*

English Literature. *Coppee*

Zoölogy *Nicholson*

Botany (voluntary)..... *Gray*

Physical culture two hours a week. English Essay and Oratory throughout the year.

SENIOR CLASS.

Classical and Scientific.

FIRST TERM.

Metaphysics.

Geology.

Optics.

English.

THIRD TERM.

Contemporaneous French Literature.	
German Reader.	<i>Whitney</i>
English.	
Chemistry.	
Botany (voluntary)	<i>Gray</i>
Calculus.	

Physical culture two hours a week. English Essay and Oratory throughout the year.

JUNIOR CLASS.

FIRST TERM.

German Literature	<i>Whitney</i>
Mechanical Work, Hydrostatics, Hydrodynamics, Pneumatics....	<i>Jackson</i>
Chemistry.	
Logic	<i>Jevons</i>

SECOND TERM.

German Tragedy.....	<i>Goethe or Schiller</i>
Heat, Steam Engine, Electricity, Meteorology.	<i>Foster</i>
Physiology.....	<i>Huxley</i>
Chemistry or Mineralogy.	

THIRD TERM.

Acoustics, Magnetism, Galvanism, Electro-Magnetism.....	<i>Foster</i>
Zoölogy	<i>Nicholson</i>
English Literature.....	<i>Coppce</i>
Botany (voluntary).....	<i>Gray</i>

Physical culture two hours a week. English Essay and Oratory throughout the year.

SENIOR CLASS.

Elective.

FIRST TERM.

Ancient and Modern Languages.
Analytical Chemistry.
Zoölogy.
Physics.

SECOND TERM.

Classical and Scientific.

Christian Evidences and Ethics.

Astronomy.

Political Economy.

English.

THIRD TERM.

Classical and Scientific.

Ethics and U. S. Constitution.

History and Philology.

History of Civilization.

Architecture.

Essays.

Physical culture two hours a week. English Essay and Oratory throughout the year.

During the Senior year, five recitations a week may be chosen from the list of Elective studies, with the consent and under the direction of the Faculty. Special arrangements will be made for advanced work in the various departments.

Metaphysics, Christian Evidences and Ethics, and U. S. Constitution are not Elective.

SECOND TERM.

Elective.

Ancient and Modern Languages.

Zoölogy.

Physics.

Mineralogy.

THIRD TERM.

Elective.

Ancient and Modern Languages.

Physics.

Botany.

Lectures on Law.

Latin or Greek of the Classical Course may be substituted for French or German in the Scientific Course.

Side reading in History (with examination and prizes) may be pursued under the direction of a Professor.

For Physical Culture, including Military Drill, a total of two additional hours per week is allowed in two or more apportionments.

CATALOGUE OF STUDENTS.

SENIOR CLASS.

s	WILLIAM PLATT ADAMS, ...	<i>Cohoes.</i>
c	LEE WILLIAM BEATTIE,.....	<i>Cornwall.</i>
s	FREDERIC SELDEN BLOSS, ...	<i>Troy.</i>
c	ANDREW ALFRED BROWNE,.....	<i>St. Gabriel, La.</i>
c	OCTAVE GIDEON BROWNE, ...	<i>St. Gabriel, La.</i>
c	WILLIAM WALLACE CHILDS,.....	<i>Charleston, S. C.</i>
c	FREDERIC FRASER CHISOLM, ...	<i>Coosaw, S. C.</i>
s	JOHN BARKLEY CONWAY, ...	<i>Argyle.</i>
e	LOUIS JACKSON DAVIDS, ...	<i>New Rochelle.</i>
c	ALONZO CLARENCE DINGMAN, ...	<i>Minden.</i>
s	JAMES ALPHEUS GOODRICH,.....	<i>Schenectady.</i>
s	GEO. STUART GREGORY,.....	<i>Albany.</i>
c	WILLIAM HAYES, ...	<i>Albany.</i>
c	JAMES HEATLEY, ...	<i>Schenectady.</i>
c	EDWARD CLARK HOYT, ...	<i>Schenectady.</i>
c	EDWARD LOUISA HUTCHINSON,... . .	<i>Summerville, S. C.</i>
c	WILLIAM FREDERIC LANSING, ...	<i>Little Falls.</i>
e	GEORGE EDWIN MARKS, ...	<i>New York.</i>
c	JOHN EDWIN MULLER, ...	<i>Columbia, S. C.</i>
e	THEODORE DACUE PALMER, ...	<i>Newark, N. J.</i>
	JOHN DAVIS PARSONS,.....	<i>Albany.</i>
s	JAMES LAMB PERRY, ...	<i>Charleston, S. C.</i>
c	NEWTON LUTHER REED,.....	<i>Huron.</i>
c	WILLIAM BENJAMIN ROPER,....	<i>Charleston, S. C.</i>
	WYLLIS AUGUSTUS SILLIMAN, ...	<i>Clarkson.</i>

c DAVID SPRAGUE,.....	<i>Schenectady.</i>
c FREDERIC VAN DUSEN,.....	<i>Glen's Falls.</i>
s JOHN NICHOLAS VAN PATTEN,.....	<i>Schenectady.</i>
s WILLIAM AUGUSTUS WALDRON,.....	<i>Cohoes.</i>
c EDWARD PAYSON WHITE,.....	<i>Amsterdam.</i>
LOUIS CROCKER BEATTIE,.....	<i>Schenectady.</i>
CHARLES HODGE BLAIN,.....	<i>Amsterdam.</i>
WALES BAKER BRADLEY,.....	<i>Marietta, Ga.</i>
EDWARD BICKWELL BURNAP,...	<i>Canajoharie.</i>
FRANCIS OLIVER CORNELL,.....	<i>Glenville.</i>
WILLIAM WALTON CRAIG,....	<i>Schenectady.</i>
WILLIAM FOURNIER,.....	<i>Schenectady.</i>
HENRY G. FRENCH,....	<i>Elizabethtown.</i>
FRANK WENTWORTH GILLESPIE,.....	<i>Schenectady.</i>
JOHN FRANKLIN GREENE,.....	<i>Jonesville.</i>
JOHN WILLIAM HENRY GRUPÈ,.....	<i>Schenectady.</i>
CLARK COCHRANE HEATH,....	<i>Amsterdam.</i>
DAVID JAMES,.....	<i>Albany.</i>
HERBERT W. KINGSLEY,....	<i>Schenectady.</i>
SETH EDGAR LASHER,.....	<i>Bethlehem.</i>
JOHN MCBRIDE,.....	<i>Hamptonburg.</i>
EDWARD McDONNELL,.....	<i>Amsterdam.</i>
SAMUEL MOORE MCGAFFIN,.....	<i>Cohoes.</i>
JAY E. MCGUIRE,....	<i>Boyleston.</i>
FRANK ELISHA MORS,.....	<i>West Troy.</i>
FRANK HENRY NICHOLS,.....	<i>West Pittston, Pa.</i>
JACOB BRILL PETERS,.....	<i>Green Haven.</i>
FRANK HENRY OSBORN,....	<i>Tonganoxie, Kan.</i>
ASHLEY POND,.....	<i>Elizabethtown.</i>
ROBERT MEANS RHETT,.....	<i>Beaufort, S. C.</i>
ARTHUR JOSEPH RODGERS,.....	<i>Brooklyn.</i>
JULIAN ALEXANDER SALLEY,.....	<i>Orangeburg, S. C.</i>
WALTER SANFORD,.....	<i>Albany.</i>
HENRY SCHLOSSER,.....	<i>Schenectady.</i>
WILLIAM HASKELL SIMONS,.....	<i>Cooper River, S. C.</i>

GERARDUS SMITH, ...	<i>Schenectady.</i>
FRANK LOUIS SNOOK, ...	<i>Monticello.</i>
CHARLES STANFORD, JR., ...	<i>Schenectady.</i>
EDWARD TANNER, ...	<i>Boyleston.</i>
LEGRAND CANNON TIBBITS, ...	<i>Hoosac.</i>
EDWARD TRAINER, ...	<i>Williamsport, Pa.</i>
CHARLES WILLIAM VEDDER, ...	<i>Niskayuna.</i>
THOMAS WATIES, ...	<i>Columbia, S. C.</i>
JAMES GILBERT WEEDEN, ...	<i>Greenfield Centre.</i>
WILLIAM HENRY TAYLOR WINNE, ...	<i>Albany.</i>

The second list consists of such as have been members of the class at any time before the beginning of the present College year.

JUNIOR CLASS.

- c* ROBERT CARTER ALEXANDER, ... *West Charlton.*
c RICHARD DINZEY ANABLE, ... *Springfield, Mass.*
e WILBER ENTRICAN ANDERSON, ... *LeRoy.*
s FREDERIC AUGUST BALLART, ... *Syracuse.*
 JAMES EVERARD BENEDICT, ... *South Northwalk, Conn.*
c CHARLES FRANCIS BISHOP, ... *Stanfordville.*
c ISAAC GIBSON BURNETT, ... *San Francisco, Cal.*
e HORACE JOSHUA CAMPBELL, ... *Greensborough, Vt.*
c JOSEPH DAVIS CRAIG, ... *Albany,*
c FRANK PHILO SANFORD CRANE, ... *New York.*
c GEORGE EDWARD DIXON, ... *Cohoes.*
e ANDREW HENRY DOUGHERTY, ... *Parkville, Mich.*
e JOHN LELAND FITZGERALD, ... *Brunswick, Ga.*
e DAVID FRANKLIN GLOVER, ... *South Haven.*
e ELI SANFORD GODFREY, ... *Easton, Conn.*
c JOHN ICKLER, ... *St. Paul, Minn.*
c JOHN ANDREW KEMP, ... *Meredith.*
c ROBERT JUDSON LANDON, ... *Schenectady.*
c ROBERT TRAILL SPENCE LOWELL, JR., ... *Schenectady.*
c JAMES MACFIE McMASTER, ... *Columbia.*
e WILLIAM JAMES McNULTY, ... *Ashland, O.*
s DAVID MUHLFELDER, ... *Ballston Spa.*
c JOHN VAN SCHAIK LANSING PRUYN, JR., ... *Albany.*
c BENJAMIN HENRY RIPTON, ... *Johnstown.*
s FRED T. RODGERS, ... *Westerly, R. I.*
e WILLIAM HENRY SADDLER, ... *Sandy Creek.*
e WRIGHT JOSEPH SWEET, ... *Dean's Corners.*
 LUCAS GROVE TUTTLE, ... *Sodus.*
 TALCOT CAMP VAN SANTVOORD, ... *New York.*
s MILES W. VOSBURGH, ... *Albany.*
c EDWARD WALTON WATKINS, ... *Schenectady.*

WILLIAM EVARTS BENJAMIN, ... *Schenectady.*

WILLIAM BRONK,.....	<i>New Baltimore.</i>
PATRICK HENRY CAIN,....	<i>Schenectady.</i>
FRANK SHERWOOD DAVENPORT,.....	<i>Davenport.</i>
FRANK SELDEN ELY,....	<i>Schenectady.</i>
EDWARD MILES GADSDEN,.....	<i>Charleston, S. C.</i>
WILLIAM JAMES GIBSON,.....	<i>West Charlton.</i>
DANIEL PATRICK HALPEN,.....	<i>Albany.</i>
JAMES ALEXANDER HAMILTON,.....	<i>Orangeburg, S. C.</i>
HERBERT DURAND HOBBS,...	<i>Malone.</i>
WILLIAM HEENIN INGRAM,.....	<i>Manning, S. C.</i>
WILLIAM BARKER LANDRETH,.....	<i>Scottsburgh.</i>
CLAUDE LACELLES LEGGE,.....	<i>Spartanburgh, S. C.</i>
WARD McALLISTER, JR.,....	<i>New York.</i>
WILLIAM THEODORE McCORKLE,...	<i>Williamstown, S. C.</i>
EDWARD BAILEY NOBLE,.....	<i>Albany.</i>
JOHN ELLIOTT PARRY,.....	<i>Sandy Hill.</i>
ISAAC CHERIGNY PORCHER,.....	<i>Pinopolis, S. C.</i>
WALTER PEYRE PORCHER,.....	<i>Charleston, S. C.</i>
WILLIAM DECHAUSTIGNEY RAVENEL, ...	<i>Charleston, S. C.</i>
PHILIP JOSEPH RYAN,.....	<i>Albany.</i>
GEORGE HENRY SLINGERLAND,.....	<i>Augusta, Ill.</i>
* HARRINGTON MANNING SMITH,....	<i>Dayton, O.</i>
JAMES STEWART,.....	<i>Johnstown.</i>
JOHN JAMES STOTT,.....	<i>Argyle.</i>
JAMES SWEENEY,.....	<i>Schenectady.</i>
HENRY TARSEWELL THOMPSON,.....	<i>Columbia, S. C.</i>
EDWARD TITSWORTH TOMLINSON,.....	<i>Adam's Centre.</i>
CHARLES H. VAN AUKEN,.....	<i>Cohoes.</i>
EDGAR LAVERNE VINCENT,.....	<i>Persia.</i>
DELANCEY WALTON WATKINS,.....	<i>Schenectady.</i>

* Deceased.

SOPHOMORE CLASS.

- e* FRANKLIN EUGENE ABBOTT,..... *Brunswick.*
c COURTLAND VIRGINIUS ANABLE,..... *Springfield, Mass.*
c FRANK CHAMBERLAIN AVERY,..... *Seneca Falls.*
s FREDERIC W. CAMERON,..... *Albany.*
s ALEXANDER CAMPBELL,..... *Troy.*
s PERRY ELLIS CARHART,..... *Guilderland.*
c ANDREW DRUMMOND DARLING,..... *Andes.*
c JOSEPH PAIGE DAVIS,..... *Schenectady.*
c EDWARD IGNATIUS DEVLIN,..... *Albany.*
c HENRY RUFUS FANCHER,..... *McGrawville.*
e SAMUEL GOURDIN GAILLARD,..... *Charleston, S. C.*
e FRANK BOYD GARY,..... *Cokesburg, S. C.*
c JAMES RICHARD GIBSON,..... *Delhi.*
c HORATIO GATES GLENN,..... *Schenectady,*
c JOHN MONROE HARVEY,..... *Schenectady,*
c JOHN JAMES HENNING,..... *Argyle.*
 LYNN WALKER HULL,..... *Sandusky City, O.*
c EDWARD CAMPBELL JOHNSON,..... *Schenectady.*
s CHARLES SUMNER KING,..... *Hammonton, N. J.*
c SANFORD V. KLINE,..... *Amsterdam.*
s EDWARD TEN EYCK LANSING,..... *Little Falls.*
c GEORGE GIBBS LELAND,..... *Mayesville.*
c JAMES WESTCOTT LESTER,..... *Saratoga Springs.*
c RICHARD TIMOTHY LOMASNEY,..... *Schenectady.*
s JOB PHILIP LYON,..... *Troy.*
c RIPLEY SHURTLEFF LYON,..... *Schenectady.*
s WILLARD CHARLES MARSELIUS,..... *Scotia.*
s SAMUEL PARIS MCCLELLAN,..... *Troy.*
s DAVID HUN MCFALLS,..... *Gouverneur.*
s CHARLES DICKENSON MENEELY..... *Albany.*
 WILLIAM TYLER MILLER,..... *Charlton.*
c FRANK WILLARD MOORE,..... *DeKalb.*

HANCOCK NEAGLE,.....	<i>Columbia, S. C.</i>
CHARLES BERTRAM PIERSON,.....	<i>Canandaigua.</i>
HOWARD NOTT POTTER,.....	<i>New York.</i>
c JOHN SAWYER,.....	<i>Cherry Valley.</i>
c JOSIAH STILL, ...	<i>Lansingburgh.</i>
c HERBERT HENRY TAYLOR,.....	<i>Brooklyn.</i>
c GEORGE BOWLER TULLIDGE, ...	<i>Cuin's P. O., Pa.</i>
c WILLIAM EDGAR VAN EPPS,....	<i>Schenectady.</i>
LANSING TALMAGE VEDDER,.....	<i>Niskayuna.</i>
c ELMER BRITTON WALLER, ...	<i>Seneca Falls.</i>
c EDWARD FREEMAN WALSH,.....	<i>Schenectady.</i>
c WILBUR FISK WATKINS,.....	<i>Baltimore, Md.</i>
WILLIAM MAXWELL WHITE,.....	<i>Amsterdam.</i>
c WILLIE PORTER WILLIAMS,.....	<i>Aiken, S. C.</i>
s WILLIAM ROBERTS WINANS,...	<i>Westfield, N. J.</i>
s IRVING WISWALL,.....	<i>Milton.</i>
c ROBERT ALVIN WOOD, ...	<i>Wolcott.</i>
c EDMUND RHETT YOUNG,.....	<i>Columbia, S. C.</i>

CALVIN E. CARPENTER, ...	<i>Troy.</i>
FREDERICK WILLIAM GARDNER, ..	<i>Saratoga Springs.</i>
IRA MESICK GARRISON,.....	<i>Ann Arbor, Mich.</i>
CHARLES HENRY JOHNSON,.....	<i>Union, N. J.</i>
PERRY H. KLINE,.....	<i>Amsterdam.</i>
WILLIAM ARTHUR SWABY LATHAM,....	<i>Seneca Falls.</i>
JAMES SUYDAM LAWRENCE,.....	<i>Seneca Falls.</i>
GEORGE KIMBERLY MENEELY, ...	<i>West Troy.</i>
BARNEY QUINN,....	<i>Bennington, Vt.</i>
JAMES LIONEL RANKINE, ...	<i>Geneva.</i>
HORACE RICHARD SHEAD, ...	<i>Oswego.</i>
CHARLES FREDERIC WEIGANDT, JR.,....	<i>Reisterstown, Md.</i>
EDWARD STIMSON YOUNGLOVE, ...	<i>Cohoes.</i>

FRESHMAN CLASS.

c	JOHN MCCAULEY ADAIR,.....	<i>Ox Bow.</i>
c	EDWARD HUMPHREY ADRIANCE,.....	<i>Scipio.</i>
	MATTHEW BEATTIE,.....	<i>Cornwall.</i>
	JAMES ROBERT BOLTON,.....	<i>Pelham.</i>
	ALBERT EDWARD CARMICHAEL,.....	<i>So. Sandlake.</i>
c	G. ALFRED P. CODWISE, ...	<i>Grantville, Mass.</i>
s	MARSHALL JOSHUA COUCH,.....	<i>So. Norwalk, Conn.</i>
s	JOHN JENKS DROWNE, JR.,... ..	<i>Plattsburgh.</i>
	CHARLES CHAUNCEY DURYEE,.....	<i>Schenectady.</i>
e	OWEN EARLY,.....	<i>Schenectady.</i>
c	THOMAS DOUGALL ELDER,.. ..	<i>Pattersonville.</i>
	LUTHER JAMES EMERSON,.....	<i>Moorton Station, Del.</i>
e	NATHAN GEORGE EVANS, ...	<i>Cokesburg, S. C.</i>
c	JAMES R. FAIRGRIEVE, ...	<i>Schenectady.</i>
c	CHARLES EDWARD FAY,.....	<i>Northampton.</i>
s	DAVIDSON SPRIGG FLOWER,.....	<i>Alexandria, La.</i>
c	EDMUND ERASTUS FORD,.....	<i>Schenectady.</i>
e	WILLIAM GIFFORD, ...	<i>Schenectady.</i>
c	ELIJAH WARNER GREENE,.. ..	<i>New Lebanon.</i>
c	SHELDON MUNSON GRISWOLD,.....	<i>Delhi.</i>
c	LUTHER R. HARGRAVE, ...	<i>Madrid</i>
	HERBERT CALVIN HINDS,.....	<i>East Greenwich.</i>
c	NATHAN GARDNER KINGSLEY, ...	<i>Jonesville.</i>
s	WILLIAM MEYER LEWIN,.. ..	<i>Upper Marlboro, Md.</i>
s	JAMES AUGUSTUS MCFARRAN,.....	<i>Cherry Valley.</i>
s	ALFRED AUGUSTUS McMURRAY,.....	<i>Lansingburgh.</i>
	WALTER MILLER,.....	<i>Minden.</i>
s	ROBERT EDWARD MORGAN,.....	<i>Tinmouth, Vt.</i>
c	EPHRAIM CLARK MURRAY,.. ..	<i>Edisto Island, S. C.</i>
e	JOHN GEORGE POOLE,.....	<i>Sandy Hill.</i>
	WALTER HUTSON PHYFE,.....	<i>Delhi.</i>
	HENRY RUFUS PIERSON, JR.,.....	<i>Albany.</i>
c	WILLIAM JAMES POLLARD,.....	<i>Seneca Falls.</i>

<i>c</i> ALBERT PRATT,.....	<i>Fort Edward.</i>
<i>s</i> JOSEPH EUGENE RANSELL, ...	<i>Alexandria, La.</i>
<i>s</i> WILLIAM BOARDMAN REED,.....	<i>Poughkeepsie.</i>
<i>s</i> WILLIAM CAMPBELL ROSEBOOM,.....	<i>Cherry Valley.</i>
<i>c</i> HERMAN MOURNS SCHERMERHORN,.....	<i>Schenectady.</i>
<i>* s</i> SAMUEL MAIRS SYLVESTER,.....	<i>Saratoga Springs.</i>
<i>c</i> CHARLES TEMPLE,.....	<i>Troy.</i>
<i>c</i> EDWARD THOMSON, JR., ...	<i>Johnsburgh.</i>
<i>c</i> JOHN SUNDERLIN VAN VECHTEN,.....	<i>Chateaugay.</i>
<i>c</i> WILLIAM ALFRED WADDELL, ...	<i>White Lake.</i>
<i>c</i> SCHURMAN HALSTED WATKINS,.....	<i>Baltimore, Md.</i>
<i>c</i> JOSEPH DOUGLAS WHITE,....	<i>Hoosac Falls.</i>
<i>c</i> BAYARD WHITEHORNE, ...	<i>Schenectady.</i>
<i>c</i> EDWARD CHARLES WHITMYER, ...	<i>Schenectady.</i>
<i>s</i> ARTHUR SILAS WRIGHT,.....	<i>Worcester.</i>
<i>c</i> ELIPHALET NOTT WRIGHT,....	<i>Boggy Depot, Ind. Terr.</i>
<i>c</i> FRANK HALL WRIGHT,....	<i>Boggy Depot, Ind. Terr.</i>

SUMMARY

OF

STUDENTS OF UNION UNIVERSITY.

UNION COLLEGE.

SENIOR CLASS, - - - - -	72
JUNIOR CLASS, - - - - -	60
SOPHOMORE CLASS, - - - - -	64
FRESHMAN CLASS, - - - - -	50
POST-GRADUATES, - - - - -	5
MEDICAL DEPARTMENT, - - - - -	153
LAW DEPARTMENT, - - - - -	64
TOTAL, - - - - -	<u>468</u>

This summary presents the total number admitted during the entire course; the thoroughness of the class-work and of examinations being a principal cause to the reduction of numbers before graduation.

PRIZES.

NOTT PRIZE SCHOLARSHIPS.

Class of 1879,

DAVID SPRAGUE.

EDWARD PAYSON WHITE.

Class of 1881,

EDWARD C. JOHNSON.

PRIZES AWARDED AT COMMENCEMENT, 1878.

INGHAM PRIZES.

ALEXANDER DUANE, Portland, Me.

WARNER PRIZE.

A. V. S. WALLACE, Little Britain, N. Y.

INAUGURAL PRIZES.

1st, WM. H. THOMAS, Stuyvesant, N. Y.

2nd, OCTAVE G. BROWNE.

LOWELL LATIN PRIZE.

ANDREW A. BROWNE.

PRIZES FOR ESSAYS IN ENGLISH LITERATURE.

1st, ALEXANDER DUANE, Portland, Me.

2nd, SEYMOUR VAN SANTVOORD, Kinderhook, N. Y.

PRIZES FOR UNDERGRADUATE SPEAKING.

Junior,

1st, WM. M. CHILDS.

2nd, WM. B. ROPER.

Sophomore,

1st, JOSEPH D. CRAIG.

2nd, ROBERT C. ALEXANDER.

CENTENNIAL ALLEN PRIZES.

1st, ALEXANDER DUANE, Portland, Me.

2nd, LEONARD PAIGE, Albany, N. Y.

3d, JOHN F. THOMAS, Stuyvesant, N. Y.

BLATCHFORD MEDALS.

1st, WM. D. MAXON, Schenectady, N. Y.

2nd, SEYMOUR VAN SANTVOORD, Kinderhook, N. Y.

WOLFE ART PRIZES.

For Greatest Improvement in Free-hand Drawing.

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SCHOOL OF CIVIL ENGINEERING
OF
UNION COLLEGE.

FACULTY.

ELIPHALET NOTT POTTER, D.D., LL.D.,
President.

JOHN FOSTER, LL.D.,
Professor of Natural Philosophy.

JONATHAN PEARSON, A.M.,
Professor of Botany.

WILLIAM WELLS, LL.D.,
Professor of Modern Languages and Literature.

MAURICE PERKINS, A.M., M.D.,
Professor of Chemistry.

Rev. GEORGE ALEXANDER, A.M.,
Professor of Logic and Rhetoric.

CADY STALEY, C.E.,
Professor of Civil Engineering.

HARRISON E. WEBSTER, A.M.,
Professor of Natural History.

LIEUT. CLERMONT L. BEST, JR., U. S. A.,
Professor of Military Tactics.

ISAIAH B. PRICE, C. E.,
Professor of Mathematics and Adjunct Professor of Physics.

CHARLES J. COLCOCK, C.E.,
Tutor in Mathematics.

EDGAR M. JENKINS,
Registrar.

SCHOOL OF CIVIL ENGINEERING.

INFORMATION.

This department was founded in 1845. Its object is to give its students such instruction in the theory and practice of Civil Engineering as to qualify them for immediate usefulness in the field and office in a subordinate capacity and at the same time to fit them to fill satisfactorily the higher positions in the profession, after a moderate amount of experience in the routine of practice. The course of instruction aims to effect this by constant exercise in mechanical draughting, instrumental field-work and numerical calculation, combined with the study of text-books and lectures on the numerous subjects where books are wanting.

The connection of the Engineering School with the College affords its students peculiar advantages for special study in the various departments of the College, to all of which the engineering students are admitted without extra charge.

The location of Schenectady is most favorable for an Engineering School. The city is on the Mohawk river and is intersected by several railroads and the Erie canal. These necessitate many bridges and other works of interest to the Engineering student. There are also extensive Locomotive Works, Machine Shops and Foundries ; all of which afford special advantages for examination and study.

REQUIREMENTS FOR ADMISSION.

Candidates for admission must present testimonials of good moral character and must be at least sixteen years of age.

Examinations for admission take place in presence of three College officers.

The stated times for such examinations will be found in the Calendar. By conforming to these appointments applicants will greatly promote their own convenience and interest as well as those of the examiners.

Candidates for the Freshman class will be examined in English Grammar, Modern Geography, Arithmetic, Algebra to Equations of the second degree, and Plane Geometry, five books.

Candidates for any other class will also be examined in all the studies previously pursued by that class as shown in the course of studies.

Students from other colleges, in addition to passing a satisfactory examination, will be required to present a letter of honorable dismission.

Students may enter at any point of the course for which they are prepared.

Any studies of the course may be taken separately by those qualified to pursue them profitably.

EXPENSES.

The College bills must be paid at the beginning of each term. In case such payment is not made within the first

week of the term, the Treasurer is instructed to inform the parent or guardian of the delinquent.

Students, unless from another College, pay for entrance into the Freshman class, \$5 ; into the Sophomore class, \$7 ; into the Junior class, \$9 ; into the Senior class, \$12.

No retrospective expense is incurred by entering in advance.

The College bills for Tuition etc. are \$40 per term.

The extra charge for the Engineering students in the Laboratory, to comprise the cost of materials used and apparatus broken, varies from \$2 to \$20 per term. A deposit is required.

The price of board in the Clubs varies from \$3 to \$4 per week, and in private families from \$3 to \$5.

The expenses of instruction, board, lights, washing, textbooks etc. during the three terms of thirty-nine weeks may vary in amount from \$250 to \$350.

TERMS AND VACATIONS.

The course of study is completed in four years. In each year there are three Terms of the average length of thirteen weeks. Commencement takes place on the fourth Wednesday in June, and the First Term begins twelve weeks after that time. This term is followed by a Vacation of nearly two weeks embracing the Christmas holidays and there is also a brief recess in the Spring. The Second Term consists of twelve weeks. The Third Term ends with Commencement.

DEGREE.

At the beginning of the last term of the course, students who are candidates for a diploma are required to undergo

a written examination on the leading points of all their preceding studies. Those who pass it satisfactorily (and complete similarly the remainder of the course) receive a diploma conferring the degree of Civil Engineer (C. E.); and it is intended that this diploma shall be a guaranty of more than average ability and industry. The others receive certificates proportioned to what they have done, both as to quantity and quality.

SPECIAL STUDENTS.

Those who are not candidates for a degree but desire to study Surveying, Road Engineering or any other special branches of the course can enter as Special students and take such studies as they require.

ARCHITECTURAL STUDENTS will find a large part of the course (particularly the Draughting, Mensuration, Stereotomy, Strength and Stability, etc.) adapted to their requirements.

DEPARTMENTS OF INSTRUCTION.

MATHEMATICS.

The studies of this department include the following : Algebra, beginning at equations of the second degree ; Geometry, beginning at the sixth book of Davies' Legendre ; Trigonometry, plane and spherical ; Conic Sections ; Analytical Geometry ; Descriptive Geometry ; Differential and Integral Calculus.

NATURAL PHILOSOPHY.

The instruction in this department commences with the third term of the Sophomore year and extends through two years.

To secure at once precision and fullness, the instruction is mainly given from recently prepared text-books. Frequent lectures are however delivered either to furnish illustration and proofs of principles by experiment or to amplify particular subjects. Thus, after the completion of Statics and Dynamics, several lectures are devoted to mechanical "work," in order that not only the construction and theory but modes of determining the *efficiency* of the various hydraulic and pneumatic machines may be understood. All lectures are required to be written out by the students in full from the notes and submitted for inspection. Numerous problems are also given on all the subjects and are mostly so constructed that the calculated results may be verified

by experiments before the class. To test the accuracy of the knowledge gained and to insure its ready command several written examinations are required in each term.

In most of the branches included in this department the apparatus is sufficient for very complete experimental illustrations; and through the liberality of friends of the College, important additions of French, English and American instruments have been made within the present year.

The following are the subjects included in the course : statics, dynamics, hydrostatics, hydrodynamics, pneumatics, optics, acoustics, heat, electricity, magnetism and galvanism.

ASTRONOMY.

The instruction in Astronomy includes Spherical Astronomy, Theory of Astronomical Instruments, and Physical Astronomy.

The students are also given a practical course in Astronomical surveying and location, comprising the determination of time, latitude and longitude, and the location of meridians, parallels, great circles and rhumb lines.

NATURAL HISTORY.

PHYSIOLOGY is taught in the second Junior term to the whole class by recitations and by lectures on Comparative Anatomy and Physiology. The subjects are illustrated by preparations and dissections.

ZÖÖLOGY is taught in the third Junior term by recitations and lectures. The work is illustrated by constant exhibition of specimens and dissections in the class-room.

Instruction in Geology is given during the first term of the Senior year in a series of recitations and lectures from 60 to 70 in number .

LITHOLOGICAL GEOLOGY. The attention of the student is first directed to a carefully identified series of specimens, and the methods and tests used in identification are given. Then unnamed specimens are given him, the nature and constitution of which he is expected to determine by comparison and by application of the proper tests.

PALEONTOLOGY. By the examination, on the part of the student, of fossils especially characteristic of the principal formations and by lectures, the attempt is made to familiarize the mind with the more important forms of extinct animal and vegetable life. The conditions favorable and unfavorable to the preservation of such forms in the rocks are also considered. Facilities for special study of Paleontology are placed at the disposal of the student without extra charge.

HISTORICAL GEOLOGY is taught, including the different conditions under which the rock-masses occur, the order of the succession of the formations in time, etc.; also,

DYNAMICAL GEOLOGY. The nature and origin of coal, peat, coral-reefs, salt; the action of water in erosion, transportation etc.; of frozen water, glaciers, icebergs; the various theories of volcanic action; earthquakes and the origin of mountains; metamorphisms; veins etc.

MINERALOGY is taught during the second Senior term by a course of practical lessons, illustrated by a complete set of models of crystals and a series of six hundred specimens for determination by crystallographic and blow-pipe examination.

BOTANY is taught during the Summer term, both from text-book (Gray's) and practically in the field.

CHEMISTRY, MINERALOGY AND METALLURGY.

The recitations in Chemistry extend through two terms. In addition to this, the students receive Laboratory instruction. They are taught by means of qualitative Analysis and exercise in the use of the blow-pipe, to determine the constitution of the useful minerals. Their knowledge of these minerals is increased by a course in determinative mineralogy in which use is made of the celebrated Wheatley Collection and a complete set of crystal models. As far as practicable the operations of industrial chemistry are carried out. Students are taught to tin zinc and to gild iron; to electro-plate with gold, silver, copper and nickel; to form the various Sulpho compounds from pyrites; to burn plaster, lime and cements and to analyze and test their efficacy; to make and examine the most important alloys; to estimate clays for buildings and fire-brick and for the manufacture of porcelain: to analyze fuels, slags and fluxes.

The student is required to go through with a thorough course in assaying, treating ores of lead, silver, copper, mercury and gold. Attached to the Laboratory is a library of Technological books always open to the students for reference.

Detached from the Laboratory is a photographic room with skylight, printing-room etc.. and instruction is given by a practical photographer.

MODERN LANGUAGES.

The Modern Languages supply the linguistic training of this course and are regular daily studies during the Fresh-

man, Sophomore and Junior year; one hour a day being given to each class, and the studies alternating according to the schedule.

Instruction is imparted by exercises in translation (written and oral), conversational practice and familiar lectures on the standard authors read.

The French Language is a regular study through six terms, beginning with the first term Freshman. The text-book mainly used is Pujol's Complete French Course. At a later period the French Dramatists, Racine and Corneille, are read.

The German Language extends through six terms, commencing the first term Sophomore. The text books are Comfort's Grammar, Whitney's Reader and the Poets Schiller and Goethe.

In order to familiarize the student with reading French and German scientific works, part of the text-books of the course are in those languages.

LOGIC, RHETORIC AND ENGLISH LITERATURE.

The instruction in Logic and Rhetoric includes the use of text-books, lectures and practical exercises in Oratory and in the various forms of Essay. In the study of English Literature, it is the aim to secure an acquaintance with the historical development of the language and with the course of English thought as expressed at different periods in the works of representative men.

The Freshmen have exercises in the elementary forms of Essay and during the first term Sophomore a text-book on Rhetoric is studied. The subject is carried still farther

in the Junior year in connection with Logic. During the Junior and the Senior year the Rhetorical exercises consist of essays and discussions; and the Classics of English Literature and its history are made the subjects of lectures and of study.

Special attention is paid to writing descriptions of Engineering projects and of structures and to making reports upon engineering.

DRAWING AND DESCRIPTIVE GEOMETRY.

The instruction in this department extends through three years.

In the second term Freshman, the student is instructed in the use of drawing-instruments and the construction of Geometrical problems: in the first term Sophomore, in Descriptive Geometry (orthographical projection). The drawings of intersections, developments etc. are from Schroeder's models, the Paris Polytechnic School models of intersections and the Olivier models. *

In the second term, Spherical Projections; One Plane Descriptive Geometry with drawings from models of Vauban's system of Fortifications; and the application of Descriptive Geometry to Stone Cutting, with drawings from the stereotomy models of the Paris Polytechnic school; Shades and Shadows.

In the third term, conventional colors, freehand drawing and drawing in plan, elevation and section. The drawings are made from models and from engineering structures.

In the first term of the Junior year, Machine Drawing; in the second term, oblique projections, including mechani-

cal, military and isometrical projections; in the third term, topographical drawing, comprising methods of representing the relief of ground by contour lines, hatchings and shades from vertical and oblique light, Bardin's models of the various forms of ground being used to illustrate the subject; in the first term of the Senior year, Natural Perspective; in the second term, Architectural Drawing.

ENGINEERING.

The subjects of the course are so arranged as to harmonize with the seasons of the year suitable to field-work or other work. The course includes the following subjects:

SURVEYING : Land Surveying with chain alone, chain and compass, transit, theodolite, plane-table and solar compass; Mining Surveying; Hydrographical Surveying; Topographical Surveying; Geodetic Surveying; and Astronomical Surveying and location.

LEVELING with the plumb-line level, water level and spirit level; Angular Leveling; and Barometric Leveling.

MENSURATION of engineering structures.

ROAD ENGINEERING: comprising the reconnaissance, location and construction of common roads and railroads; the improvement of the surface of common roads, graveling, McAdamizing, paving, planking etc.; the construction of railroads, including earthwork, mechanic structure, superstructure and equipment.

ENGINEERING STATICS: Statical Forces, weights of bodies, fluid pressure, semi-fluids, heat, cold, animal force etc.; Dynamical Forces, solids in motion, impact, pile-driving, waves, wind etc.

STRENGTH OF MATERIALS: data and formulas for calculating the resistance of materials to extension, compression, torsion, bending and breaking.

STABILITY OF STRUCTURES: data and formulas for calculating the resistance of frames, roofs, bridges, retaining-walls, arches etc., to giving way by dislocation, overturning, sliding etc.

GENERAL CONSTRUCTION: Materials, foundations, masonry, carpentry etc.

BRIDGE ENGINEERING: Plans and calculations of the forms and dimensions of bridges of wood, iron and stone. A working model of a bridge, in which the strains at various points are shown by a Dynamometer, illustrates the identity of the results of theory and experiment.

WATER ENGINEERING: Hydraulic formulas, the supply of water for towns and for irrigation, the removal of water by drainage and sewerage, canals, the improvement of river navigation, harbors, sea coasts etc.

AGRICULTURAL ENGINEERING.

SANITARY ENGINEERING.

FIELD WORK.

The instruction is made as practical as possible. The students have constant practice in the field whenever the weather will permit. The field-work consists in Land Surveying with the compass and chains etc., Triangular and Trilinear Surveying and the use of the transit, solar compass and plane table; Common, Trigonometric and Barometric Leveling and the use of the spirit level, water level, theodolite and barometer; Road Engineering, comprising

the reconnaissance and location of a line of road, leveling the line, running curves, staking out side-slopes and foundation-pits, etc. (a corps for road-engineering being regularly formed and each student taking in turn the position of flag-man, chainman, rodman, leveler and transitman); Astronomical Surveying and Location, and the use of the sextant.

VOLUNTARY STUDIES.

Any of the studies of the Classical or of the Scientific Course of the College can be taken by the Engineering students without extra charge. Many avail themselves of this opportunity for special study in Ancient Languages, Natural History, Mental and Moral Science, Rhetoric, Logic etc.

INSTRUMENTS AND APPARATUS.

This department is fully supplied with field instruments of the best description, comprising Transit, Surveyor's Compass, Prismatic Compass, Burneir's Compass, Solar Compass, Y Levels, the Levels of Troughton, Egault, Lenoir and Burneir ; Plane Table, Sextant, Octant, Mountain Barometers, Aneroid Barometer and a Chronometer.

The extensive private collection of models and instruments belonging to the late Professor Gillespie, has been purchased for the department, making the entire collection the most complete in the country.

The collection of models in Descriptive Geometry and Stereotomy is very complete. The following are some of the most important :

THE OLIVIER COLLECTION. This consists of about fifty models representing the most important and complicated ruled-surfaces of descriptive geometry, particularly warped or twisted surfaces. Their directrices are represented by brass bars, straight or curved, to which are attached silk threads representing the elements or successive positions of the generatrices of the surfaces. Each of these threads has a weight suspended by it so as always to make it a straight line. These weights are contained in boxes sustaining the directrices and their standards. The bars are movable in various directions, carrying with them the threads still stretched straight by the weights in every position they may take ; so that the forms and natures of the surface which they constitute are continually changing while they always remain ruled-surfaces. In this way a plane is transformed into a paraboloid, a cylinder into a hyperboloid, etc.

These models were invented by the lamented Theodore Olivier, while Professor of Descriptive Geometry at the Conservatoire des Arts et Metiers in Paris. One set of them is now deposited there and a second is in the Conservatory of Madrid. Copies of some of them are to be found in most of the polytechnic schools of Germany. The Union College set is the original collection of the inventor, having been made in part by his own hands and after his death in 1853 retained by his widow till bought from her by Professor Gillespie in 1855. It is more complete than that in the Paris *Conservatoire*. It may be worth noticing that the silvered plates on the boxes reading, "Inventé par Théodore Olivier," etc., were added by Madame Olivier after the purchase, at her own expense, as a tribute to the memory of her husband ; her own words being, "*Je tenais*

à ce que chaque instrument portât le nom du savant dont la réputation passera à la postérité."

Among the most remarkable peculiarities of these models is their experimental demonstrations of various important theorems of Higher Geometry ; as also their suggestion of greatly enlarged views of the near relationship of seemingly dissimilar geometrical forms, if not their essential identity ; since the movements which the various parts admit cause one surface gradually to pass into another as in a dissolving view ; so that, for example, a plane is seen to be only a particular case or limit of a hyperbolic paraboloid ; a cylinder and a cone to be only extreme cases of a hyperboloid of one sheet, etc.

At the same time the singular beauty of form and color which the models possess arouses the admiration of those entirely ignorant of their mathematical attractions.

Prof. Bardin's (Paris) plaster models (seventy) of the INTERSECTIONS of prisms, pyramids, cylinders, cones, etc.

Schroeder's (Darmstadt) models (twenty) of elementary DESCRIPTIVE GEOMETRY. The planes of projection are in wood, and the lines and surfaces in metal ; metals illustrating Shades and Shadows.

STONE CUTTING models (twenty) in plaster, selected from those of L'Ecole Polytechnique of Paris.

Prof. Bardin's models (ten) in plaster, of OBLIQUE ARCHES.

Groined and cloistered arch models (ten) in wood and plaster. Models of structures in stone, consisting of bridges, culverts etc.

Winding-stair models in wood and plaster. Full-sized models of voussoirs and skew-backs of an oblique arch.

MODELS in TOPOGRAPHY : French and German plaster

models giving all the different forms of ground, accompanied by topographical drawings showing how to represent these forms by contour lines, hatchings and shades from vertical and oblique light; Models and Maps in Colored Topography; A large Model of Mont Cenis Pass, showing the wagon-road and contour lines.

ARCHITECTURE: Models of the five orders of Architecture from L'Ecole des Beaux Arts, Paris; Portals; Stairs; Roofs; Walls; Buttresses; Domes etc.

ENGINEERING: Schroeder's models of joints, brick bonds, etc.; spur wheels, bevel wheels; cranes; pile-driver; various forms of water-wheels; pumps; cylinders; valves, eccentrics etc.; steam-engines.

Casts of St. Venant's models showing the changes of form in bodies subjected to flexure. Full-sized model of the liquid vein measured by Poncelet and Lesbros.

Models of Bridges on various systems, comprising truss, suspension, tubular and arch bridges; Doyné's Dynamometer Bridge Model, showing by means of a Dynamometer strains at different points; models of roof trusses, arranged for using the Dynamometer to show the different stresses.

Models of Fortifications, illustrating Vauban's system; shot, shell etc.

Models of Culverts, Piers, Abutments, Culvert Heads, Recess Pool, Wing Walls, Rail Sections, etc.

PHYSICAL APPARATUS.

The collection of apparatus for illustrating the several branches of Natural Philosophy is very extensive. The latest and best which home and foreign workshops can pro-

duce have been procured in order to render the collection as complete as possible.

FOR PRECISE MEASUREMENTS: Steel scales of English and French measures; graduated vessels of various measures and volumes; balances by Becker and other makers; Spherometer by Buff and Berger; Wollaston's goniometer; Theodolites etc.

COLLECTIONS IN THE DEPARTMENT OF CHEMISTRY.

IN MINERALOGY: The Wheatley Collection contains nearly 4000 specimens of minerals, the results of the labors of Charles M. Wheatley. All of these have been labeled according to the nomenclature and order adopted by Dana. They are without exception open at all times to the students. They furnish an admirable means of practical illustration in Mineralogy, the mineralogical recitation-room being connected with the large hall. Among the rare and valuable specimens are those of Anglesite, Cerussite, Mimetine and Calcopryrite, which in American specimens are equalled only by those in the British Museum. There are many fine specimens representing the noble metals from all parts of the world. There are few known species of minerals of which the collection does not contain some specimens.

In addition to this there is a large series of unlabeled specimens for crystallographic and blowpipe examination.

IN METALLURGY: The College possesses a suite of ores of the useful metals comprising over 1000 specimens. These have been arranged to illustrate their mode of occur-

rence and geographical distribution. In addition are the fluxes, fuels etc., used in obtaining the metals from the ores, together with the slags and metals themselves in various forms. There is a large number of models and drawings of stacks, furnaces etc.; also suites of specimens of wood, charcoal, mineral coal, peat etc., both for actual examination and for physical inspection; also specimens of most of the useful alloys.

IN INDUSTRIAL CHEMISTRY: A large number of specimens of the materials used in the manufacture of the mineral and of some of the organic acids; the crude products themselves and the materials used in the manufacture of the alkalies; soaps, matches; black lead; candles; petroleum products; linseed, olive, castor, cotton-seed and other oil; paper; porcelain; glass; fire and building brick; mortar and cements; beet and cane sugars; white lead and other paints; etc., etc.

IN AGRICULTURAL CHEMISTRY: For the study of this branch of chemistry the College has a large suite of specimens of manures natural and commercial, together with the apparatus for their analysis and also for the analysis of soils.

The Chemical Laboratory is well furnished with apparatus for work both in analytical and manufacturing chemistry.

MAPS, DRAWINGS ETC.

This collection embraces a large number of maps, plates, profiles, topographical drawings and spherical projections; about fifty thousand engravings, lithographs, photographs, and detail drawings of Engineering and Architectural Structures; working drawings of machines, bridges, buildings etc.

LIBRARY.

The students have the use of the College and Society Libraries. A large room has been fitted up for the accommodation of the Library, so that students can have access to it at all times for consultation. It has received extensive and valuable additions by the purchase of the Engineering and Scientific Library belonging to the late Professor Gillespie. A recent endowment of twenty thousand dollars puts the Library on an independent foundation, so that it will be kept up with the advance of science.

READING ROOM.

The Gillespie Club, a Society of Engineers, have a reading room well supplied with newspapers, magazines and the principal Engineering and Scientific Journals.

PHYSICAL CULTURE.

The students are instructed in Military tactics by an officer of the U. S. Army ; and a large Gymnasium, completely furnished, affords ample opportunities for physical training.

For catalogues or for special information, address C. STALEY, Schenectady, N. Y.

COURSE OF STUDY.

FRESHMAN CLASS.

FIRST TERM.

English language.
 French Grammar.....*Pujol*
 Algebra, (continued) to "Series".....*Davies*

SECOND TERM.

History.
 French Grammar and Reader....*Pujol*
 Algebra, completed.....*Davies*
 Drawing — Plane Problems.

THIRD TERM.

French Grammar and Reader*Pujol*
 Geometry — Books VI to IX.*Legendre*
 Trigonometry — Plane and Spherical.....*Jackson*
 Calculations; rapid, accurate and approximate.

Physical culture two hours a week. English Composition or
 Essay throughout the year.

SOPHOMORE CLASS.

FIRST TERM.

French Poetry.
 German Grammar....*Comfort*
 Descriptive Geometry.....*Church*
 Rhetoric.....*Hill*
 Analytical Geometry.

SECOND TERM.

Contemporaneous French Literature.
 German Grammar and Reader....*Comfort*
 Calculus.
 Descriptive Geometry.....*Church*
 Mensuration.....*Price*
 Drawing — Shades and Shadows.

THIRD TERM.

Contemporaneous French Literature.	
German Reader	<i>Whitney</i>
Chemistry.	
Surveying	<i>Gillespie</i>
Calculus.	

Physical culture two hours a week. English Essay throughout the year.

JUNIOR CLASS.

FIRST TERM.

German Literature.....	<i>Whitney</i>
Mechanics.....	<i>Jackson</i>
Surveying	<i>Gillespie</i>
Machines.	
Chemistry.	
Logic	<i>Jevons</i>

SECOND TERM.

German Tragedy	<i>Goethe or Schiller</i>
Electricity, Magnetism, Galvanism.....	<i>Foster</i>
Physiology.....	<i>Huxley</i>
Analytical Mechanics.	
Drawing — Oblique Projection.	

THIRD TERM.

Chemistry.....	<i>Coske</i>
Heat, Steam Engine.....	<i>Foster</i>
Strength of Materials.....	<i>Gillespie</i>
Zoology.	
Topographical Mapping.	

Physical culture two hours a week. English Essay throughout the year.

SENIOR CLASS.

FIRST TERM.

Road Engineering.....	<i>Gillespie</i>
Geology.....	<i>Dana</i>
Optics.....	<i>Jackson</i>
Chemistry	<i>Cooke</i>
Stability of Structures	<i>Gillespie</i>

SECOND TERM.

Engineering Construction.

Astronomy *Gummere*

Metallurgy.

Ethics.

Drawing.

THIRD TERM.

Physical Laboratory.

Physical Geography.

Ethics.

Law of Contracts and Right of Way.

Botany.

Thesis.

Physical culture two hours a week. English Essay throughout the year.

DEPARTMENT OF GENERAL CULTURE AND OF ART.

UNDER THE DIRECTION OF THE PRESIDENT OF THE COLLEGE.

The Department of General Culture and of Art (sustained by the generous benefactress who endowed in the sum of fifty thousand dollars the John David Wolfe Memorial Scholarships Foundation) seeks, in connection with the regular College courses, to furnish to the student such instruction and practice in Belles Lettres and Art as will contribute to his general culture and as his time may permit; and to furnish also to the Art student the principles, methods and practice of his specialty. It embraces also Physical Culture.

Lectures and other instruction are given in History, Literature and Language, on the Principles of Criticism in Art, on Self-culture, Social and Practical life and similar subjects. Students are required to present one essay during the Freshman year, five essays during the Sophomore, five during the Junior and three during the Senior. These Essays are criticized on the margin as to quality of thought, concentration and method; as to clearness, strength and harmony of style; and as to grammar, spelling and punctuation. They are corrected by the student and returned to the Professor. The student is informed regarding the mental tendencies evinced in his essays and is advised as to the reading and form of self-culture particularly adapted to his needs. One Declamation is also required in the third term Freshman, five Declamations during the Sophomore

year and five during the Junior; also, two original Orations during the Junior year and two during the Senior; the orations being delivered in the College Chapel before Professors and all the classes.

Students desiring Modern Languages but unable to attend the regular classes may pursue these studies in this department.

A Reading Room is included in this Department, for the free use of all the students, which is supplied with about fifty periodicals and newspapers, native and foreign, and with an equal number of books of reference, encyclopædias, atlases etc. The Room is kept open all day during the entire week and also during the short vacations.

In Fine Art, lectures and other instructions are given in the Theory, History and Literature of Architecture, Painting, Sculpture and Music; with practice in the processes of these, especially in Free-hand Drawing. In the last-mentioned instruction, and practice, elementary as well as advanced, in Decorative, Landscape and Scenic Drawing are afforded. Architectural and Industrial Design is also taught. Prizes are awarded for proficiency and also for improvement. Seniors have the privilege of visits to the studio of E. D. Palmer, A.M., with explanations and illustrations of the processes of sculpture by the artist; and also of visits to the studio of Mr. John Ehninger. All students of the College are allowed the use of the studio of Mr. Wells three hours a week, without charge, as also all other advantages of the Department.

Musical Recitals are given during the winter at the house of the President, with brief lectures delivered by him on the history of Music; the lectures being accompanied with instrumental and other illustrations. The vocal and instrumental instruction is conducted by Prof. J. Albert Jeffery, a Prize graduate of the Royal Conservatorium of Leipzig.

In Physical Culture, the exercises are regulated by a competent instructor. The gymnasium with its excellent apparatus is open during every day and four evenings a week. Students may enjoy its privileges at any hour. The system of drill in the Military Department is an important incidental aid in this direction. Thomas W. Featherstonhaugh, A.M., M.D., has been intrusted with the charge of instruction in Hygiene by lecture and otherwise.

An Art Collection has been begun, containing already some admirable casts, models, several hundred photographs, stereoscope and stereopticon pictures, of ancient and modern statuary, paintings and edifices; also, some marbles and several interesting American and Oriental Antiquities.

The Art Library contains valuable works on the plastic arts and on Music.

POST-GRADUATE DEPARTMENTS

OF UNION UNIVERSITY.

MEDICAL DEPARTMENT.

The Collegiate Year includes a Spring Course and a Regular Session. Attendance at the Spring Lectures is optional but strongly recommended; attendance at the Winter Course is requisite for graduation. Students matriculate at either.

The Spring term (devoted to dissecting, laboratory work, clinical lectures at Hospital and lectures on special subjects at College) begins on April 1st and continues eight weeks. There are three lectures daily ; free to matriculants. The regular Fall term begins October 7th and continues twenty weeks. Degrees are conferred only after strict examination at the end of the Fall term.

Fees for first year — Matriculation, \$5; Term, \$100; Dissection, \$10 (without incidentals). Fees for second year — Matriculation, \$5; Term, \$100; Graduation, \$25 ; total for two years, \$245. The purchase of a Perpetual Lecture Ticket (at \$150) reduces this amount to \$195. Boarding expenses are from \$4 to \$6 a week.

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